

REMARKS/ARGUMENTS

Claims 1-20 are currently pending. Claims 1, 7, 13, 19 and 20 have been amended. The following claims have been canceled: claim 3 has been canceled and substantially all of the limitations of claim 3 have been amended into claim 1; claim 9 has been canceled and substantially all of the limitations of claim 9 have been amended into claim 7; and claim 15 has been canceled and substantially all of the limitations of claim 15 have been amended into claim 13. Applicants submit that no new matter has been inserted in the application due to the amendments. Claims 1, 2, 4-8, 10-14, and 16-20 will remain pending in this application after entry of this amendment.

In the Office Action of Sept. 26, 2006, claims 19 and 20 were rejected under 35 U.S.C. §112, ¶2 for indefiniteness. Claims 1, 2, 7, 8, 13, and 14 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application Publication No. 2003/0110263 to Shillo. Claims 3, 4, 9, 10, 15, and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Shillo in view of U.S. Patent Application Publication No. 2004/0205206 to Naik et al. Claims 5, 6, 11, 12, 17, and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Shillo in view of U.S. Patent Application Publication No. 2003/0135385 to Karpoff.

Rejections under 35 U.S.C. §112

Applicants have amended claims 19 and 20 to correct the antecedent problems noted by the Examiner. Therefore, Applicants respectfully request that the rejections of claims 19 and 20 be withdrawn.

Rejections Under 35 U.S.C. 102(e)

Claims 1, 2, 7, 8, 13, and 14 were rejected under 35 U.S.C. §102(e) as being anticipated by Shillo. Applicants have amended independent claims 1, 7 and 13 and respectfully submit that the amended independent claims are not anticipated by Shillo. For example, independent claim 1 recites a management server connected to a plurality of servers to manage storage areas included in storage apparatuses as virtual storage areas wherein:

said management server being responsive to an area assignment instruction of storage areas exceeding unassigned areas received from one of said plurality of servers to release at least part of said assignment areas of other servers as unassigned areas and assign released areas to one of said plurality of servers, wherein upon receiving an area assignment instruction, the management server judges whether (i) a size of the unassigned areas exceeds a size of the storage areas specified by said area assignment instruction, (ii) a total size of the unassigned areas and unused areas exceeds the size of the storage areas specified by said area assignment instruction, or (iii) a total size of the unassigned areas, the unused areas and storage areas having stored low-priority data exceeds the size of the storage areas specified by said area assignment instruction, and when the condition (iii) is met, said management server releases at least part of storage areas in which the low-priority data is stored, of the assignment areas of other servers as unassigned areas and assigns at least areas to one of said plurality of servers. (Claim 1.).

Claim 1 recites a management server connected to a plurality of servers to manage storage areas included in storage apparatuses as virtual storage areas. In the event that the management server receives an area assignment instruction, the management server judges whether any one of three conditions have been met: (i) whether the size of the unassigned areas exceeds the size of the storage areas specified in the storage area request; (iii) whether the sum of the size of the unassigned areas and the size of the unused areas together exceeds the size of the storage areas specified in the storage area request; or (iii) whether the sum of the size of the unassigned areas, the size of unused areas, and the size of areas where low-priority data is stored exceeds the size of the storage areas specified in the storage area request. If condition (iii) is met, then the management server releases at least part of the storage areas in which low-priority data is stored as well as unused but assigned storage areas.

Applicants submit that Shillo discloses a computer network including multiple storage nodes each having a physical storage resource. A system management server on the network identifies the physical storage and collects it into a virtual storage pool. When an application executing on a storage client accesses network storage, the system management server allocates a segment of the virtual storage pool to the application. The system management server monitors the application's use of the network storage and transparently and dynamically reallocates the virtual segment to an optical physical storage resource. Shillo, Abstract.

Applicants submit that Shillo fails to teach to at least each element of amended claim 1. For example, Shillo fails to teach at least a management server specifically "releas[ing] at least part of storage areas in which the low-priority data is stored" when the size of storage areas specified in an area assignment instruction is greater than the "total size of the unassigned areas and unused areas" but is less than the "total size of the unassigned areas, unused areas, and storage areas having stored low-priority data" as recited in claim 1. The Office Action admits that Shillo fails to disclose high and low priority data, judging whether the data is high or low priority, and releasing storage allocated to low priority data and reassigning the storage in response to an area assignment instruction request that exceeds the total amount of unassigned and unused storage space. Office Action mailed Sept. 26, 2006, page 7, paragraph 3 — page 8, paragraph 1. The Office action relied on Naik for showing this limitation. However, as discussed below, Naik is distinguished. Therefore, Shillo fails to anticipate independent claim 1, because Shillo fails to teach each of the features recited in independent claim 1. Accordingly, Applicants respectfully request that the rejection of independent claim 1 be withdrawn.

Independent claims 7 and 13 should also be allowable for at least the same rationale provided for claim 1, and others. Furthermore, dependent claims 2, 8, and 14 should also be allowable at least due to their dependence from independent claims 1, 7, and 13.

Rejections Under 35 U.S.C. 103(a)

Claims 3, 4, 9, 10, 15, and 16

Claims 3, 4, 9, 10, 15, and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Shillo in view of Naik.

As described above, Applicants have amended independent claims 1, 7, and 13, and Applicants respectfully submit that the combination of Shillo and Naik fails to anticipate amended claims 1, 7 and 13. As such, Applicants submit that dependent claims 4, 10, and 16 should also be allowable at least due to their dependence from claims 1, 7, and 13. Applicants have canceled claims 3, 9, and 15.

The Office Action relies upon the combination of Shillo and Naik to disclose or suggest each of the limitations of dependent claims 4, 10, and 16. However, as described above, Shillo fails teach at least "releas[ing] at least part of storage areas in which the low-priority data is stored" where the size of storage areas specified in an area assignment instruction is greater than the "total size of the unassigned areas and unused areas" but is less than the "total size of the unassigned areas, unused areas, and storage areas having stored low-priority data" as variously recited in independent claims 1, 7, and 13. Naik similarly fails to teach at least these limitations recited in independent claims 1, 7, and 13.

Naik discloses a resource management and reservation system ("RMRS") for managing and reserving storage bandwidth. RMRS acts as a platform independent middleware layer that provides an interface to applications, their database management systems, or other higher level data management systems. RMRS allows each application or application side management system to communicate expected future storage access requirements such as periodic access for backups. RMRS also allows applications to request urgent storage access such a recovery actions that may be requested without advance notice. Naik, Abstract.

As describe above, the Office Action admits that Shillo fails to disclose high and low priority data, judging whether the data is high or low priority, and releasing storage allocated to low priority data and reassigning the storage in response to an area assignment instruction request that exceeds the total amount of unassigned and unused storage space. Office Action mailed Sept. 26, 2006, page 7, paragraph 3 — page 8, paragraph 1. The Office Action instead relies on Naik to teach these limitations of claim 1. Naik, however, also fails to teach at least releasing storage allocated to low priority data and reassigning the storage in response to a request for data storage space.

Instead, Applicants submit that Naik describes a system for managing and reserving storage resource bandwidth that assigns priorities to task competing for input/output (I/O) bandwidth of the storage resource. In periods of high activity, high priority tasks will be allocated I/O bandwidth while lower priority tasks will rescheduled or will have the amount of I/O bandwidth allocated to them decreased. Naik, paragraph 0071. Applicant submit that Naik merely describe the reallocation of I/O bandwidth for communication with a storage device, and

that Naik is silent as to the reallocation of storage space allocated to low priority data in response to an area assignment instruction. Therefore, Shillo and Naik, both alone and in combination, fail to disclose or suggest all of the features recited in independent claim 1. Independent claims 7 and 13 should also be allowable over the combination of Shillo and Naik for at least the same rationale as claim 1, and others. Accordingly, Applicants respectfully request that the rejection of dependent claims 4, 10, and 16, which should also be allowable at least due to their dependence from independent claims 1, 7, and 13.

Claims 5, 6, 11, 12, 17, and 18

Claims 5, 6, 11, 12, 17, and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Shillo in view of and Karpoff.

As described above, Applicants have amended independent claims 1, 7, and 13, and Applicants respectfully submit that the combination of Shillo and Karpoff fails to anticipate amended claims 1, 7 and 13. As such, Applicants submit that dependent claims 5, 6, 11, 12, 17, and 18 should also be allowable at least due to their dependence from claims 1, 7, and 13.

The Office Action relies upon the combination of Shillo and Karpoff to disclose or suggest each of the limitations of claims 5, 6, 11, 12, 17, and 18. However, as described above, the Shillo fails teach at least "releas[ing] at least part of storage areas in which the low-priority data is stored" where the size of storage areas specified in an area assignment instruction is greater than the "total size of the unassigned areas and unused areas" but is less than the "total size of the unassigned areas, unused areas, and storage areas having stored low-priority data" as variously recited in independent claims 1, 7, and 13. Karpoff similarly fails to teach at least these limitations recited in independent claims 1, 7, and 13.

Karpoff discloses systems and methods for delivering electronic data storage to consumers. A Utility Storage model is disclosed that addresses the needs of Storage Service Providers (SSPs). A method is provided for providing storage services to an end consumer with low entry cost threshold that encourages incremental consumption by the end consumer.

Karpoff, Abstract, and paragraph 0040-0041.

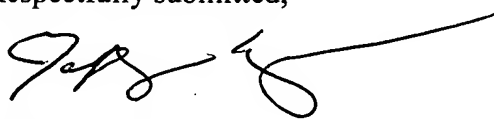
Karpoff is silent as to releasing data storage allocated to low priority data where an area assignment request exceeds the total of the unused and unassigned data storage as variously recited in independent claims 1, 7, and 13. Therefore, Shillo and Karpoff, both alone and in combination, fail to disclose or suggest all of the features recited in independent claim 1. Independent claims 7 and 13 should also be allowable over the combination of Shillo and Karpoff for at least the same rationale as claim 1, and others. Accordingly, Applicants respectfully submit that dependent claims 5, 6, 11, 12, 17, and 18 should also be allowable over Shillo and Karpoff at least due to their dependence from independent claims 1, 7, and 13.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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